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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/796,105

03/10/2004

Minoru Sakaii

NIT-164-04

2368

24956

7590

04/03/2007

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.

1800 DIAGONAL ROAD

SUITE 370

ALEXANDRIA, VA 22314

EXAMINER

SODERQUIST, ARLEN

ART UNIT

PAPER NUMBER

1743

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

04/03/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

6

Office Action Summary	Application No. 10/796,105	Applicant(s) SAKAIRI ET AL.	
	Examiner Arlen Soderquist	Art Unit 1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 21-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f):
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>3-10-04</u> . | 6) <input type="checkbox"/> Other: ____ |

Art Unit: 1743

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Van Berkel or Asam.

In the paper Van Berkel teaches gas chromatography-tandem mass spectrometry implemented on a bench-top quadrupole ion trap-based instrument using random noise to effect collision-induced dissociation. A simple and effective method for collision-induced dissociation (CID), implemented through application of random noise to an end-cap electrode, allows gas chromatography (GC)-tandem mass spectrometry (MS-MS) experiments to be performed on a commercial bench-top quadrupole ion trap mass spectrometer. Details of the random noise CID experiment, the characteristics of the noise spectrum, and the effect of varying noise spectrum and ion trap parameters on MS-MS spectra are discussed using N,N-diethylaniline as a model compound. Compromises to the technique imposed by current software flexibility limitations are also discussed. GC-MS-MS spectra, generated using random noise CID, are shown for methamphetamine and amphetamine ionized via isobutane chemical ionization.

In the paper Asam presents collision-induced signal enhancement as a method to increase product ion intensities in MS/MS and MS_n experiments. Collision-induced signal enhancement (CISE), a new technique to enhance the MS_n capabilities of the quadrupole ion trap, is demonstrated. CISE is based on the chemical, i.e., the dissociation pathways, of the analyte examined. Polysaccharides up to hexamers are used to demonstrate the capabilities of CISE to enhance signal in two distinct functional modes. Mode 1 CISE is designed to enhance the signal of an ion desired for MS_n anal. Mode 2 CISE is designed to enhance structurally significant product ions in an MS/MS spectrum. Two different approaches can be utilized to effect the two functional modes of CISE. Both approaches use conventional resonant excitation techniques to effect dissociation, which is performed non-analytically, i.e., without isolation of the ions to be dissociated. The two approaches are (1) single-frequency resonance excitation, and (2) broad-band wave form resonant excitation. Experimental results for Mode 1 CISE analysis demonstrate up to a 17.3-fold signal increase for the single-frequency approach and 5.3-fold

Art Unit: 1743

using broad-band excitation. Mode 2 CISE analysis shows up to a 16.3-fold increase in signal strength with single-frequency excitation and 3.3-fold using broad-band excitation. The experimental section teaches broadband waveforms that are generated and applied to the ion trap endcaps.

3. Claims 21 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Plomley. In the paper Plomley describes tandem mass spectrometry of polychlorodibenzo-p-dioxin and polychlorodibenzofuran in a quadrupole ion trap and compares single-frequency, secular frequency modulation, and multifrequency resonant excitation modes. A study was carried out on three modes of resonant excitation in the development of an analytical protocol for the determination of polychlorodibenzo-p-dioxins (PCDDs) and polychlorodibenzofurans (PCDFs) by ion trap tandem mass spectrometry. The resonant excitation modes studied are single-frequency irradiation (SFI), secular frequency modulation (SFM), and multifrequency irradiation (MFI) of isolated molecular ion species. Each excitation mode was examined for fragmentation channel selectivity so as to optimize instrument sensitivity. Collision-activated dissociation mass spectra obtained with each excitation mode are compared with those obtained by triple-stage quadrupole mass spectrometry (TSQMS). While the same reaction channels (corresponding to losses of Cl^\bullet , COCl^\bullet , and 2COCl^\bullet for PCDDs and Cl^\bullet , COCl^\bullet , and COCl_2 and COCl_3^\bullet for PCDFs) were observed for each excitation mode, the fragment ion relative abundances differed among the resonant excitation modes and showed that internal energy deposition in the precursor ion was in the order $\text{MFI} > \text{SFI} > \text{SFM}$. In each resonant excitation mode, the observed conversion efficiency for loss of COCl^\bullet exceeded that observed with TSQMS. The procedure of tuning SFI to ion secular frequencies was laborious, while the required duration of irradiation with SFM was excessively long compared to the gas chromatography time scale. The tuning requirements of MFI using 1 and 2 kHz bandwidth pulses were less rigorous than those for SFI, and the duration of irradiation was compatible with the gas chromatography time scale. The MFI mode is anticipatory of claims 21 and 23.

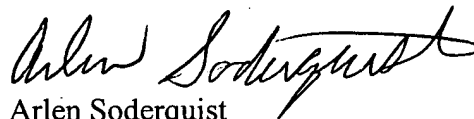
4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additionally cited art relates to excitation methods in ion traps for collisionally induced dissociation.

Art Unit: 1743

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arlen Soderquist whose telephone number is (571) 272-1265. The examiner can normally be reached on Monday-Thursday and Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Arlen Soderquist', with a stylized, flowing script.

Arlen Soderquist
Primary Examiner
Art Unit 1743